

## New claims:

1. A process for preparing alkenylaromatic compounds by reacting alkylaromatic compounds in the presence of steam and natural gas or methane over a suitable catalyst at a temperature of from 400 to 800°C and a pressure of from 0.01 to 10 bar, wherein the molar ratio of steam to alkylaromatic compound is from 5.95:1 to 1:1, the molar ratio of methane to alkylaromatic compound is from 0.1:1 to 8:1, and the methane is admixed before contact with the catalyst.
2. A process for preparing alkenylaromatic compounds as claimed in claim 1, wherein the molar ratio of steam to alkylaromatic compound is from 5.9:1 to 2.5:1.
3. A process for preparing alkenylaromatic compounds claim 1 or 2, wherein the molar ratio of methane to alkylaromatic compound is from 0.2:1 to 6:1.
4. A process for preparing alkenylaromatic compounds as claimed in any of claims 1, 2 or 3, wherein the reaction is carried out in from two to six steps.
5. A process for preparing alkenylaromatic compounds as claimed in any of claims 1, 2, 3 or 4, wherein the alkylaromatic compound used is isopropylbenzene, ethylbenzene, 1,1-diphenylethane or an alkylpyridine compound.
6. A process for preparing alkenylaromatic compounds as claimed in any of claims 1, 2, 3 or 4, wherein the hydrocarbon compound used is ethylbenzene.
7. A process for preparing alkenylaromatic compounds as claimed in any of claims 1, 2, 3, 4, 5 or 6, wherein the natural gas comprises at least 90 vol% of methane.
8. A process for preparing alkenylaromatic compounds as claimed in any of claims 1, 2, 3, 4, 5, 6 or 7, wherein the reaction is carried out in radial flow reactors.

Preparation of alkenylaromatic compounds

Abstract

5 A process for preparing alkenylaromatic compounds by reacting alkylaromatic compounds in the presence of steam and natural gas or methane over a suitable catalyst at a temperature of from 400 to 800°C and a pressure of from 0.01 to 10 bar, wherein the molar ratio of steam to alkylaromatic compound is from 6.9:1 to 10 1:1 or the molar ratio of methane to alkylaromatic compound is from 0.1:1 to 8:1.

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